

# Notice of Allowability

Application No.

09/672,253

Examiner

Melur Ramakrishnaiah

Applicant(s)

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 5-17-2004.
2. ☒ The allowed claim(s) is/are 1-22.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.


Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

## Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

  
MELUR RAMAKRISHNAIAH  
PRIMARY EXAMINER

***Allowable Subject Matter***

1. The following is an examiner's statement of reasons for allowance: this invention is related in general to the filed of digital signal processing. More particularly, the invention is related to digital signal self-adapting graphic equalizer and method.

The prior art of record in combination or alone fails to teach or suggest these elements of independent claims 1, 8, 16, 21, and 22 in combination with other elements. For example independent claim 1 has claim limitations such as an adaptive graphic equalizer having plurality of equalizing filters, the plurality of equalizing filters having different center frequencies and spanning a predetermined bandwidth, each equalizing filter being operable to filter I<sup>th</sup> sub-band of the audio signal, a plurality of first filters coupled to the audio system, each filter being operable to filter a programmed I<sup>th</sup> sub-band of an audio output signal of the audio system, a plurality of second filters receiving the audio signal, each second filter being operable to filter a programmed I<sup>th</sup> sub-band of the audio signal, and a gain adjuster operable to adjust I<sup>th</sup> sub-band of the adaptive graphic equalizer in response to difference in the I<sup>th</sup> sub-band of the filtered output signal from the plurality of the first filters and the I<sup>th</sup> sub-band of the filtered audio signal from the second filters. Independent claim 8 has claim limitations such as receiving an output signal from the audio system, the output signal being generated by the audio system in response to the audio signal, dividing the output signal into the programmed N sub-bands and filtering a programmed I<sup>th</sup> sub-band of the output signal, where  $I = 1-N$ , dividing the audio signal into the same programmed N sub-bands and filtering a programmed I<sup>th</sup> sub-band of the audio signal, where  $I = 1-N$ , determining

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a difference between the  $I$ th filtered sub-band of the audio signal and the  $I$ th filtered sub-band of the output signal, adjusting the gain of the  $I$ th equalizing filter of an adaptive graphic equalizer in response to difference between the  $I$ th filtered sub-band of the audio and output signals, the equalizing filters having different center frequencies and spanning a predetermined audio bandwidth, and generating an equalized audio signal and providing the equalized audio signal to the audio system. Independent claim 16 has limitation of claim 8 plus the following: time averaging the  $N$  sub-bands of the filtered output signal, time averaging the  $N$  sub-bands of the filtered audio signal, normalizing the time averaged  $N$  sub-bands of the filtered output signal and the time averaged  $N$  sub-bands of the filtered audio signal, determining the difference between the  $I$ th filtered sub-band of the audio signal and the  $I$ th filtered sub-band of the output signal, adjusting the gain of the  $I$ th equalizing filter of an adaptive graphic equalizer in response to the difference between the  $I$ th filtered sub-band of the audio and output signals, the equalizing filter having different center frequencies and spanning a predetermined audio bandwidth, and generating an equalized audio signal and providing the equalized audio signal and providing the equalized audio signal to the audio system. Independent claims 21 and 22 have limitations similar to limitations in claim 16 plus a dB converter coupled to the time averaging circuit operable to convert the time averaged plurality of filtered output signals and time averaged plurality of filtered signals to dB space, and a normalization circuit receiving the time averaged plurality of filtered output signals and the time averaged plurality of filtered audio signals in dB space and adjusting the signals using equations shown in claims 21 and 22. For

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the above reasons, independent claims 1, 8, 16, 21-22 and dependent claims 2-7, 9-15, 17-20 are allowable.

2. Claims 1-22 are allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melur Ramakrishnaiah whose telephone number is (571)272-8098. The examiner can normally be reached on 9 Hr schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curt Kuntz can be reached on (571) 272-7499. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Melur Ramakrishnaiah  
Primary Examiner  
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